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ALBERTA

SECONDARY ROAD SYSTEM

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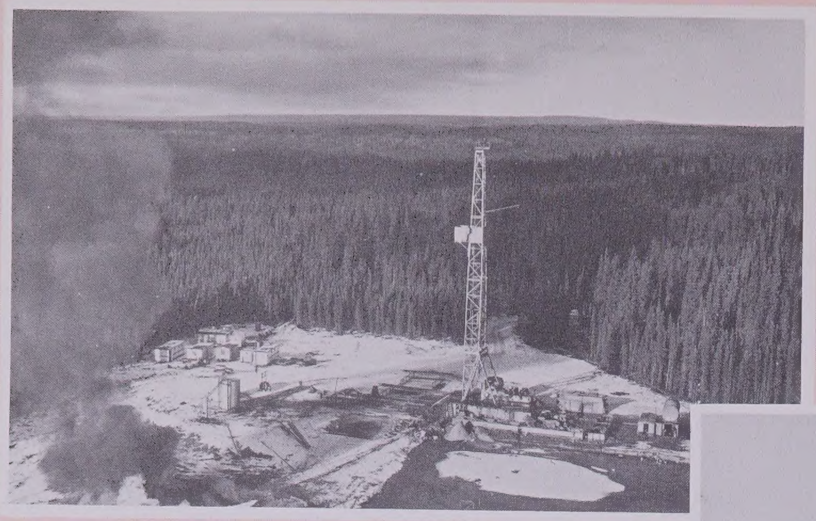

HIGHWAYS ARE THE VITAL LINKS WHICH INTERCONNECT ALL PHASES OF PROVINCIAL ACTIVITY.

ALBERTA

SECONDARY ROAD SYSTEM

A REPORT TO

THE GOVERNMENT OF ALBERTA

Prepared By

THE ALBERTA DEPARTMENT OF HIGHWAYS

PLANNING BRANCH

Edmonton, Alberta
February, 1968

PRINCIPAL PARTICIPANTS IN THE STUDY

THE COUNTIES OF:

- ATHABASCA
- BARRHEAD
- BEAVER
- CAMROSE
- FORTY MILE
- GRANDE PRAIRIE
- LAC STE. ANNE
- LACOMBE
- LEDUC
- LETHBRIDGE
- MINBURN
- MOUNTAIN VIEW
- NEWELL
- PAINTEARTH
- PONOKA
- RED DEER
- ST. PAUL
- SMOKY LAKE
- STETTLER
- STRATHCONA
- THORHILD
- TWO HILLS
- VERMILION RIVER
- VULCAN
- WETASKIWIN
- WHEATLAND

THE MUNICIPAL DISTRICTS OF:

- ACADIA
- BONNYVILLE
- CARDSTON
- FAIRVIEW
- FLAGSTAFF
- FOOTHILLS
- KNEEHILL
- LAMONT
- PEACE
- PINCHER CREEK
- PROVOST
- ROCKY VIEW
- SMOKY RIVER
- SPIRIT RIVER
- STARLAND
- STURGEON
- TABER
- WAINWRIGHT
- WESTLOCK
- WILLOW CREEK

REGIONAL PLANNING COMMISSIONS:

- Battle River Regional Planning Commission
- Calgary Regional Planning Commission
- Edmonton Regional Planning Commission
- Medicine Hat Regional Planning Commission
- Oldman River Regional Planning Commission
- Peace River Regional Planning Commission
- Red Deer Regional Planning Commission

ENGINEERING CONSULTANTS TO THE MUNICIPALITIES:

- Associated Engineering Services Ltd.
- Beairsto, Stewart, Weir Engineering Ltd.
- Canadian Engineering Services Ltd.
- W. J. Francl and Associates Consulting Engineering Ltd.
- L. G. Grimble and Associates Ltd.
- Stanley Associates Engineering Ltd.
- Stewart, Wier, Stewart and Watson
- Underwood, McLellan and Associates Ltd.

PLANNING CONSULTANTS TO THE MUNICIPALITIES:

- Makale, Holloway and Associates Ltd.
- Underwood, McLellan and Associates Ltd.
- Walker, Newby and Associates Ltd.

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PROVINCIAL PLANNING BOARD

DEPARTMENT OF HIGHWAYS:

- The Honourable Gordon E. Taylor, Minister
- L. H. McManus, P.Eng., Deputy Minister
- V. E. McCune, P.Eng., Chief Engineer

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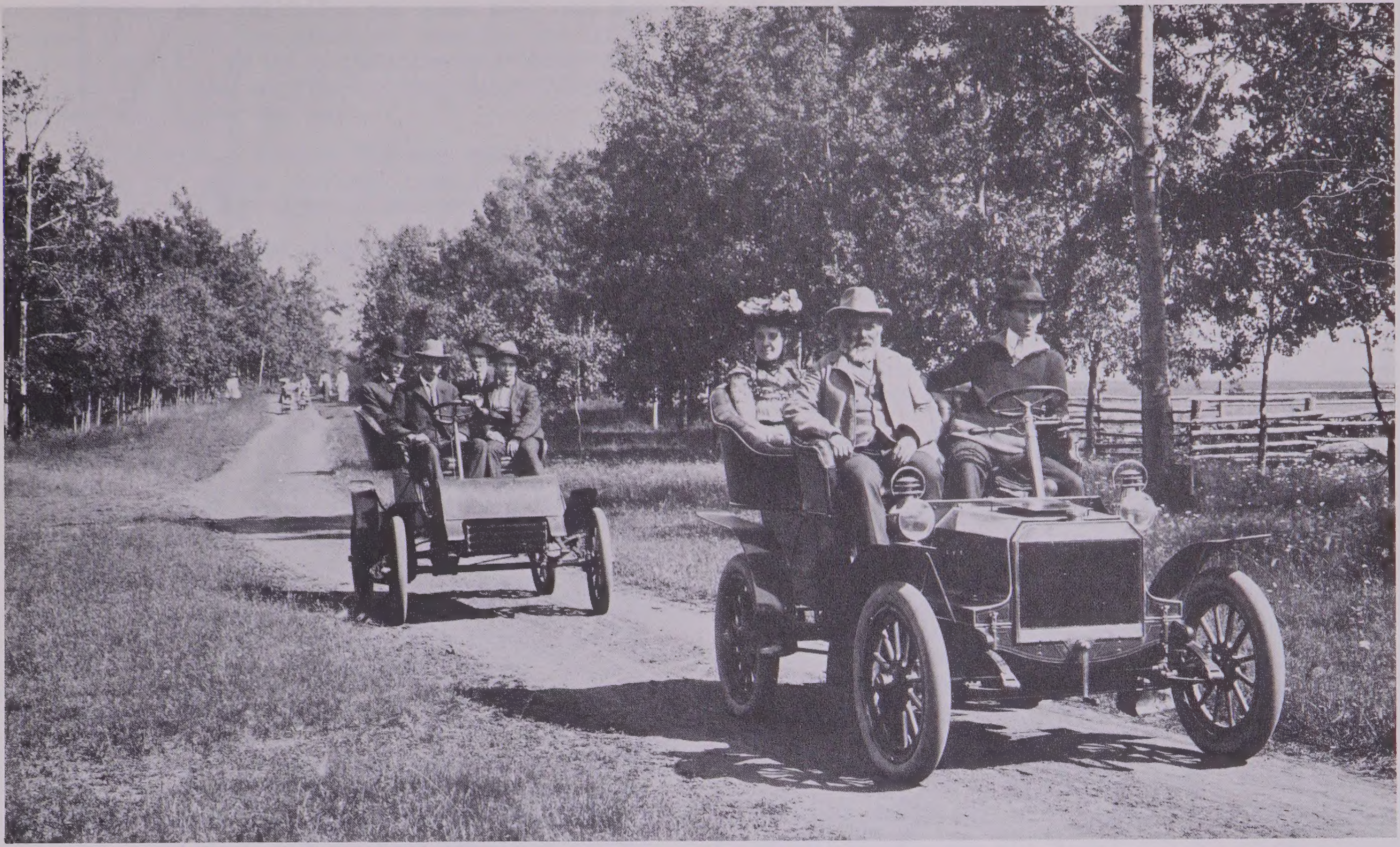


MOTORING - 1903

THE RURAL ROAD PROBLEM

INTRODUCTION

Transportation is a derived event which is generated by the human activities of an area. In a Province such as Alberta, urban activities, farming operations, resource development and tourism all contribute to production of ever increasing travel demands. An adequate network of roads and highways is essential to meet this demand.

The problem of rural highway planning for a provincial region is a complex one and the objectives should be stated at the outset of a study. The initial objective is to meet the basic demands for transportation facilities and may be viewed as four separate requirements.

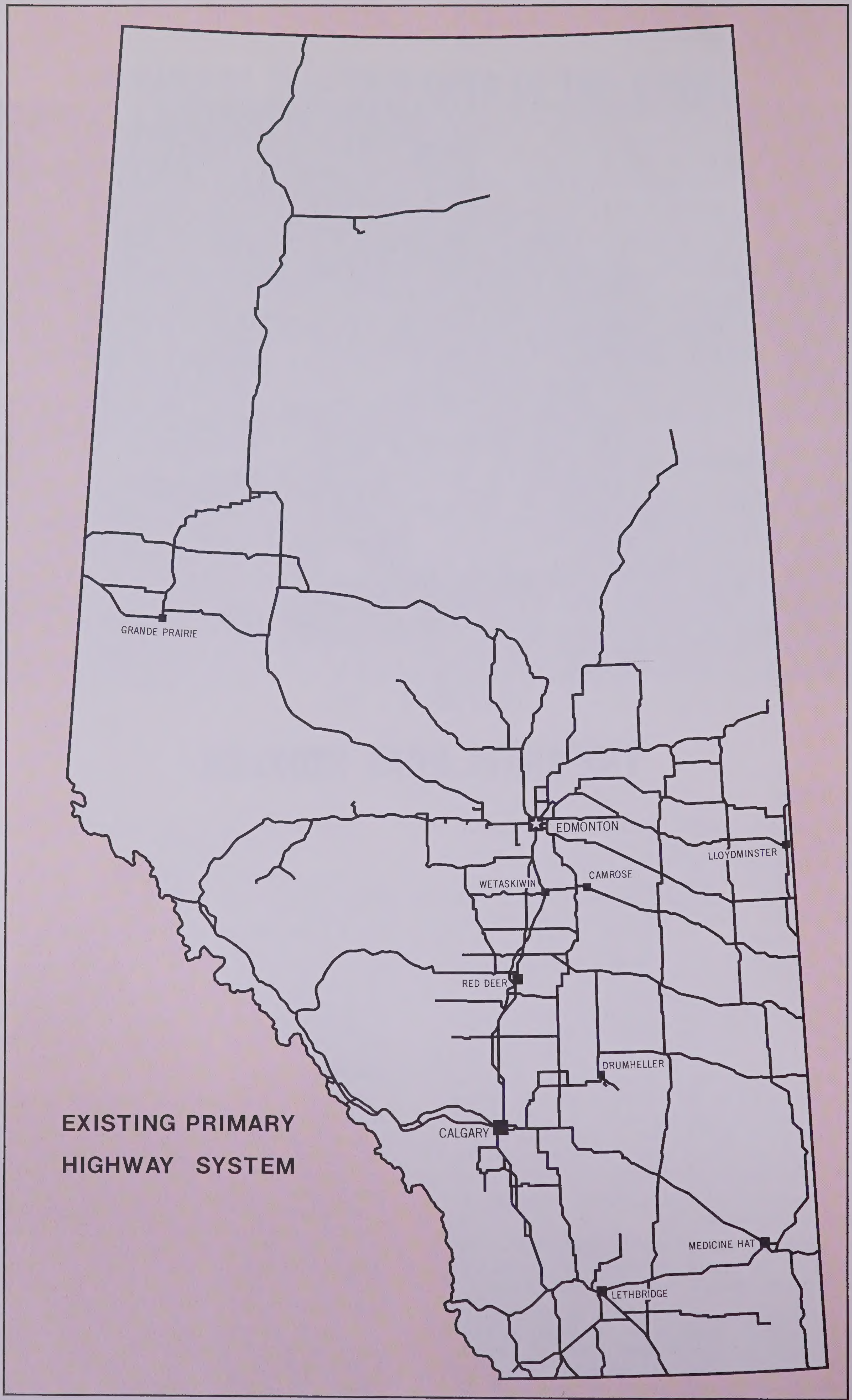
1. The need to overcome a construction backlog that accumulated during the decade of the 1930's due to depression, during the 1940's due to World War and during the 1950's due to the demand that followed the war which could not be met, even by sizable construction programs.
2. The replacement of facilities which must be upgraded when they wear out.
3. The demand presented by the expansion of the population, the number of registered vehicles and the tendency towards more travel per capita.
4. The rapid progress of technology in the construction of roads and automobiles has produced a demand for better service and quality of highway facilities. Traffic wishes to travel faster, with greater convenience and safety, requiring more expensive construction standards to serve the same amount of travel demand. Increased service demands also spell obsolescence for structurally sound roads built to older standards.

The problems of meeting the need for more and better transportation facilities in Alberta are many. The rural population of the Province is widespread, requiring a large mileage of rural highways to serve relatively light population densities. Rural road mileages are increasing rapidly, often independently of any overall planning or fiscal policy. Further, because of the large mileage of this system, it has not been possible to develop the high standard, all weather, dust-free road network which is required for this system.

HISTORY

In 1922 the Legislative Assembly of the Province enacted The Public Highways Act which in part created a Good Roads Board and provided for classification of all roads as Main Highway, Market Road, Local Road or Colonization Roads. The Public Highway Act of 1929 provided for a District Highways Board which included representation from the Provincial Government and the Municipal Districts of the Province. The duties of this Board were to consider and determine a system of District Highways for the Province and to determine the basis for allocation of all monies voted by the Legislative Assembly for District Highways and Local Roads.

The District Highway and Local Road System consisted of 60,000 miles in 1929 which increased to 80,000 miles in 1955 and to 85,000 miles in 1965. District highways alone accounted for about 10,000 miles initially but increased rapidly to 17,983 miles in 1955 and to 19,854 in 1965, an average growth



The existing Provincial Primary Highway system consists of approximately 6,700 miles of roads. Of this mileage, about 4,500 miles are paved. The total Primary Highway mileage is increasing at the rate of 100 miles per year.

of approximately 190 miles per year over the last decade. It should be noted the increase in district highway mileage was not at the expense of local roads which in themselves increased at the rate of 300 miles per year for the last ten years.

The Provincial Primary Highway mileage has increased at an almost constant rate of growth from 3,200 miles to 6,727 miles in the period since 1935.

The 1966 Public Highways Development Act states that the Minister may designate as a Secondary Road any existing or proposed rural road, town or village street, or highway in an Improvement District or Indian Reserve. The Act also provides for establishment of a Secondary Roads Board comprising representatives of the Provincial Government and the rural municipalities. Duties of the Board are to co-ordinate the establishment of a Secondary Roads System in the Province. Rural municipalities may submit a plan for a Secondary Road System in the municipality to the Board and upon acceptance of the Board and the Minister of Highways it will be the approved plan for the Secondary Road System. It is from these approved plans that the Secondary Road System will be programmed for construction and cost sharing of construction expenditures will be determined.

ECONOMY

Alberta, the fourth largest Province in Canada, with an area of 255,285 square miles, has the greatest variety of geographical topography of any Canadian Province. Inherent in such a wide variety of physiographic features is Alberta's diversity of land uses. Basically the agricultural land use associated with the physiographic regions are categorized as, wheat specialty, livestock specialty, livestock and grain, mixed farming and irrigated special crops, all of which occupy thirty percent of the total land area.

As well, Alberta is rich in natural resources with large revenues from oil and gas, mining and an abundance of forest products. Development of resources is a dynamic process with new oil field discoveries, development of the Athabasca Tar Sands and the Grande Cache coal deposits.

Tourism, another asset to Alberta's economy, flourishes on the variety of landscape and is accommodated by numerous Provincial parks in addition to five National Parks, Banff and Jasper being the most widely known.

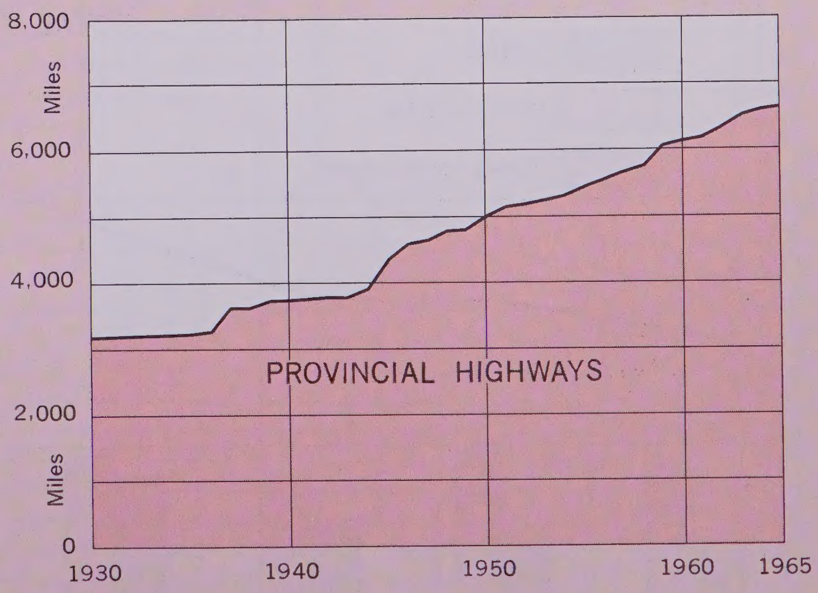
Economically and socially, Alberta is dependent on 10 cities, 99 towns and 163 villages, with Edmonton the Provincial capital and Calgary being the two major focal points. It is within the influence of these urban areas that manufacturing and industry is thriving.

Alberta has developed into an economically stable Province, brought about by a diversity of its economic base. No longer is there an over-dependence on one part of the economy. In 1935, agricultural production of 80 million dollars made it the dominant industry with 54 percent of the net value of production, followed by manufacturing 16 percent, mining 11 percent and construction 10 percent. In 1965 the ratios have changed drastically with agriculture producing 478 million dollars but only accounting for 20 percent of the net value of production with mining at 32 percent, manufacturing 22 percent and construction at 22 percent.

ROAD MILEAGE

DISTRICT HIGHWAYS

1955	17,983 MILES
1960	18,873 MILES
1965	19,854 MILES



PROVINCIAL HIGHWAY MILEAGE HAS INCREASED 3,400 MILES IN 35 YEARS
DISTRICT HIGHWAY MILEAGE HAS INCREASED 1,900 MILES IN 10 YEARS

POPULATION

The population growth and distribution in the Province has shown a dramatic change, with a swing from a rural oriented society to a relocation in the urban areas. While the total population of the Province has doubled from 732,000 in 1931 to 1,463,000 in 1966, the urban population has increased fourfold in this period. It is expected this trend will continue into the future. The Economic Council of Canada has predicted that by 1980, the urban population will make up 80 percent of the total population of Canada. The 1981 population forecast for Alberta is 2,204,000 persons of which 80 percent is predicted to be urban and 20 percent rural.

Alberta's population distribution was 62 percent rural to 38 percent urban in 1931. This ratio changed to 52 percent rural in 1951 then to 31 percent in 1966. However, the total rural population has remained at a stable level of approximately 450,000 varying only slightly with the changing social and economic climate of the last 35 years. The prediction that the 1980 population of 2,204,000 will be 20 percent rural gives an estimated projection for rural population of 440,000 persons, indicating the stable rural population base will persist.

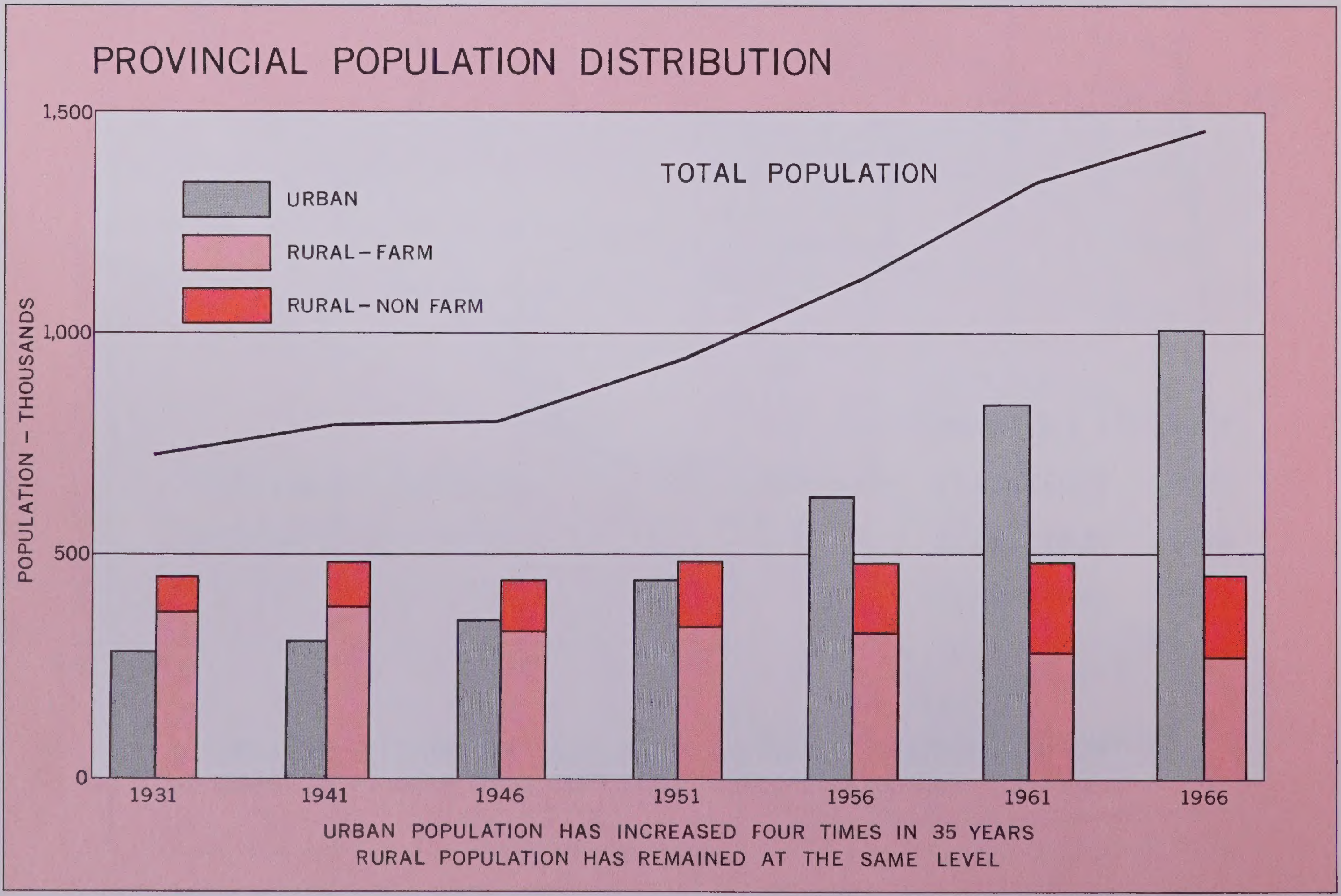
The long term trend is towards an increasing urban population rising above a stable rural population.

The alteration of population distribution patterns can be attributed to a number of factors. The trend to land consolidation, which recognizes that small farms are no longer economical units, has resulted in an increase in the size of the average farm. Mechanization and use of labour saving technology on farms is decreasing the need for labour forces while at the same time increasing the agricultural productivity. Increased mobility has also altered travel and hence population patterns in the rural areas. There is a growing tendency for farming families to migrate to nearby urban centres while still carrying on their farming operations or to make an increasing number of trips to urban centres for centralized services, recreational facilities and social amenities.

TRAVEL

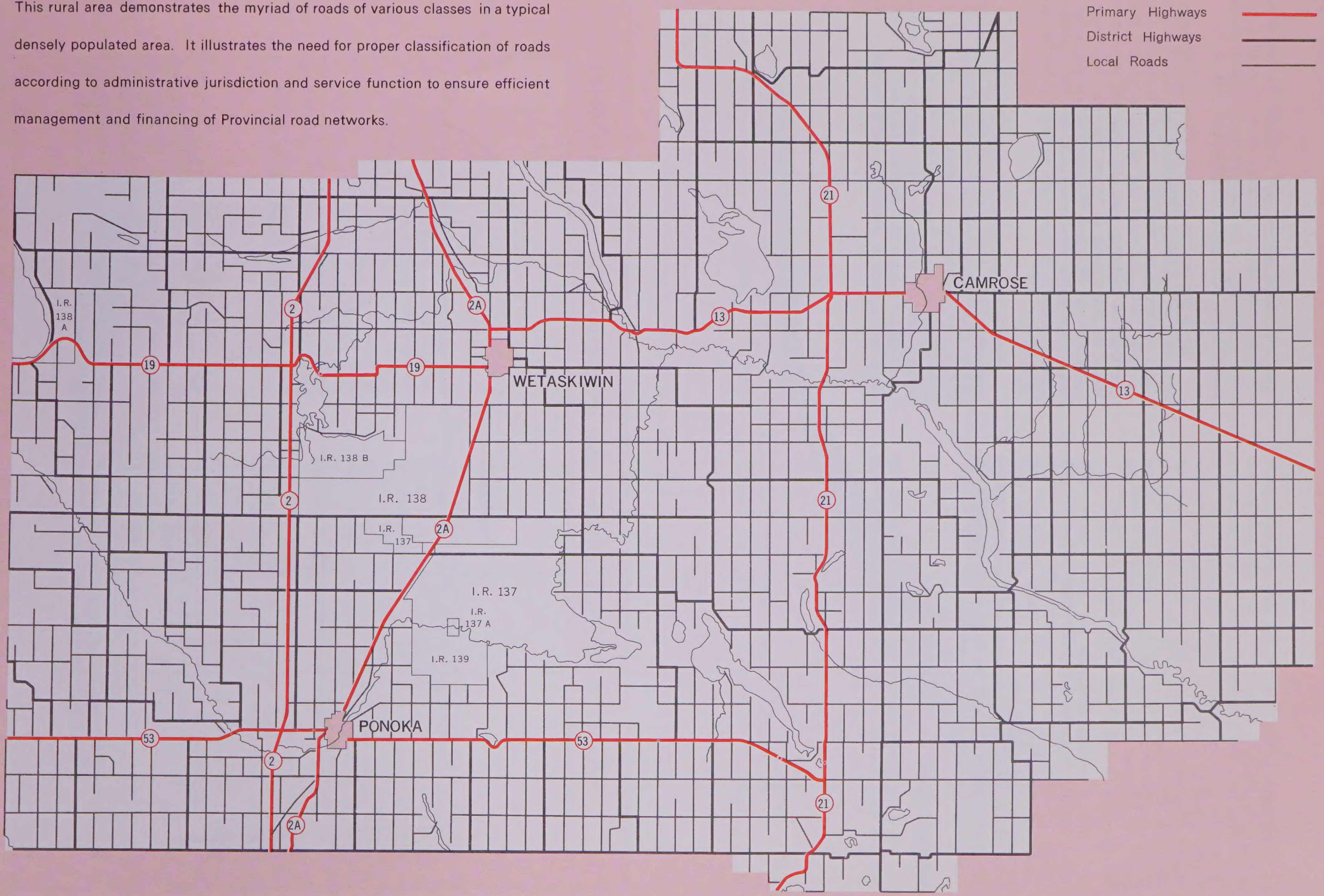
In the period since the development of the automobile, the demand for highway facilities has grown as a function of the population, the number of vehicles owned by the population and the propensity of the population to travel. These three factors have been growing at an ever increasing rate.

Since 1945, all factors related to travel have advanced at a rapid rate in Alberta. Total population has approximately doubled. Vehicle registration has more than quadrupled increasing from 139,000 vehicles to 639,000 vehicles. Fuel consumption has increased sixfold. The per capita vehicle ownership has decreased from 5.7 persons per vehicle to 2.3 persons per vehicle and is rapidly approaching a saturation level of one effective vehicle for every two persons. Total travel in the Province has increased six times to five billion vehicle-miles. It is expected each of these factors will continue to increase in the future.



EXISTING ROAD NETWORK OF A TYPICAL STUDY AREA

This rural area demonstrates the myriad of roads of various classes in a typical densely populated area. It illustrates the need for proper classification of roads according to administrative jurisdiction and service function to ensure efficient management and financing of Provincial road networks.



The greatly improved social and economic position of the population has meant more available leisure time. This has had a marked effect on the propensity of people to travel, particularly for recreational and social purposes. Persons in the rural areas are experiencing the need for increased travel as a result of centralization of services and functions. As a measure of this overall trend, the average vehicle was driven about 5600 miles per year in 1945 while in 1965 the average vehicle was driven 7600 miles per year.

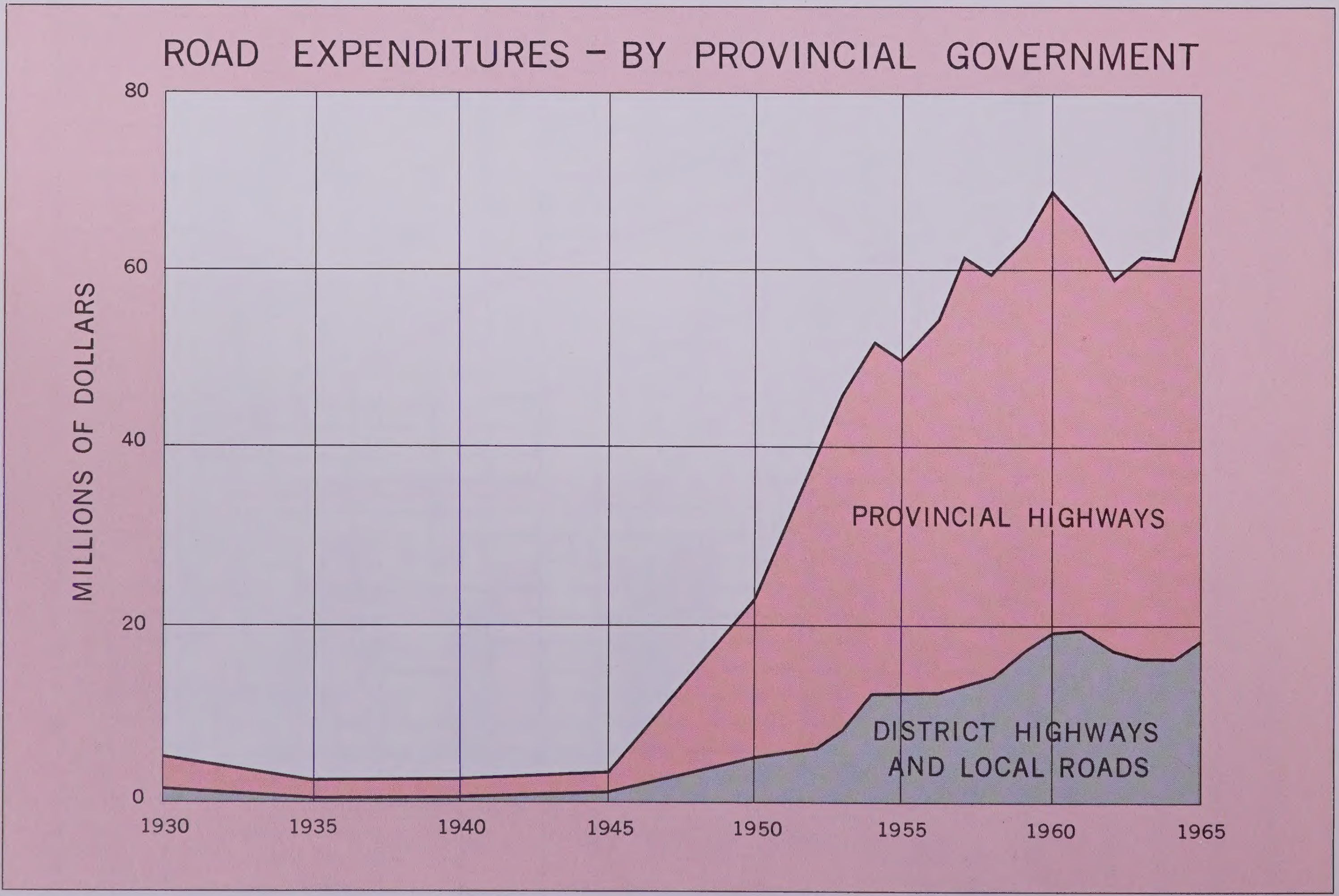
The increased demands for more, better and safer highway facilities will make itself felt in all segments of the transportation system. The large urban areas are beginning to feel the traffic problems that accompany rapid expansion and high population density. The rural highway and local road systems require re-assessment in light of the need to satisfy these demands with a high level of service.

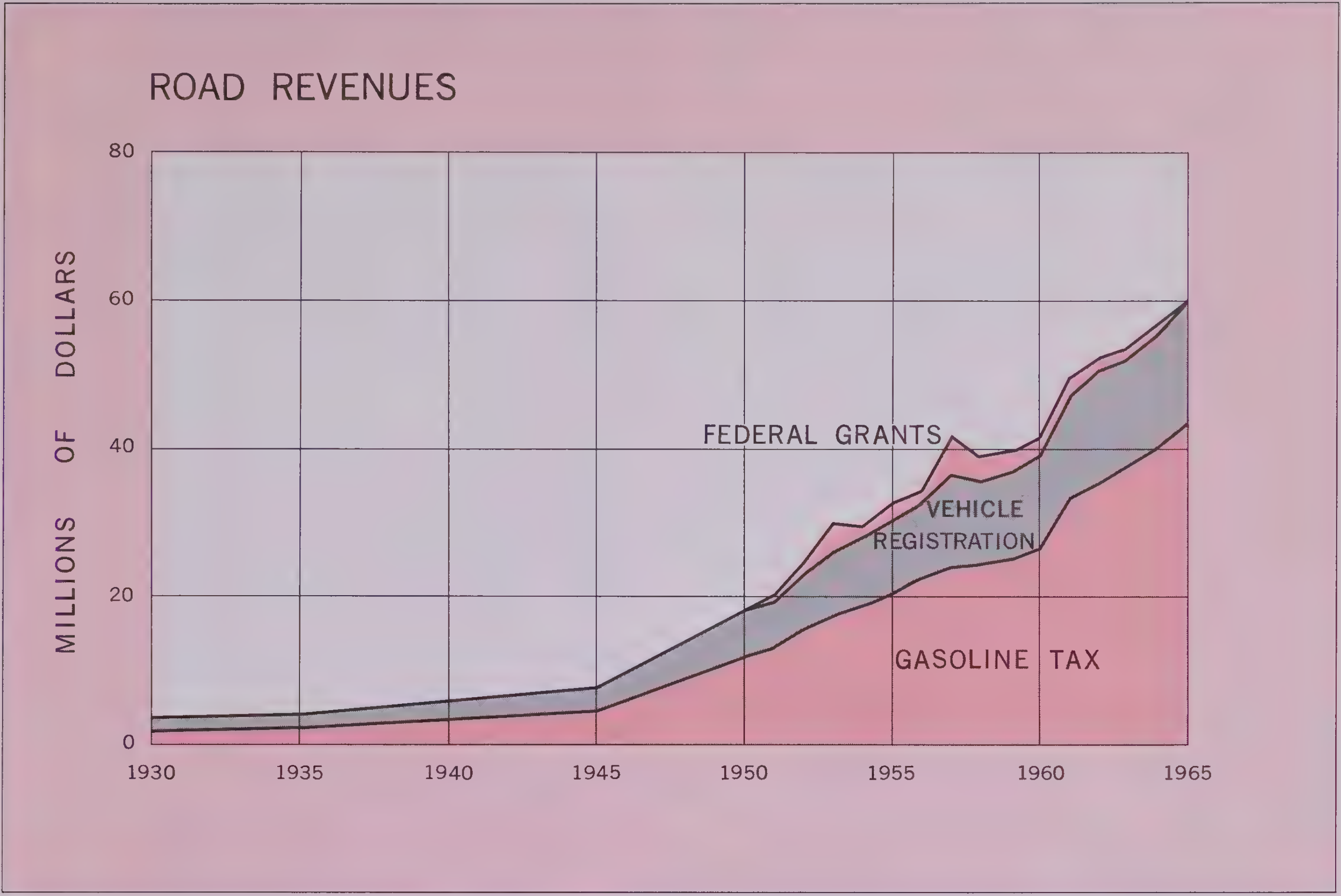
EXPENDITURES

The Provincial Government is responsible for the cost of construction of Provincial Primary Highways and the municipalities are assisted in construction of District Highways and local roads through a system of financial aid in the form of direct grants or actual construction of roads and bridges.

While the Provincial Primary Highway Mileage has increased at a relatively constant rate over the last 35 years, expenditures have only begun to increase rapidly since 1945, to meet the demands of the pre-war construction backlog and the post-war expansion of travel for more miles of higher standard highways. Expenditures on Primary Highways remained below the five million dollar level from 1930 to 1945. Since 1945 these expenditures have risen to over 52 million dollars in 1965.

Grants to municipalities also remained at a low level until 1945 when they rose rapidly from approximately One Million Dollars to the present level of Eighteen Million Dollars in 1965. Financial assistance is rendered to rural municipalities through grants for construction of roads and in addition the Province constructs bridges on District Highways and local roads and approach roads for major bridge projects.





REVENUES

A comparison of expenditures and revenues over the last 35 years reveals no apparent relationship between the two with revenues consistently less than expenditures. With the expected increase in motor vehicle useage, revenues will increase as well as the need for greater expenditures. As with expenditures, the road user revenues remained at a low level until 1945 after which they increased rapidly in relation to the number of vehicle registrations, the amount of fuel consumed and the level of tax on fuel. Revenues have risen from a 1945 level of Eight Million Dollars to Sixty Million Dollars in 1965.

The major source of road user revenue is the Provincial taxation on fuel which was instituted in 1922 at two cents per gallon of gasoline and has risen progressively to its present level of twelve cents per gallon of gasoline and fourteen cents per gallon of diesel fuel. Additional revenues are realized from motor vehicle registrations and from Federal grants.

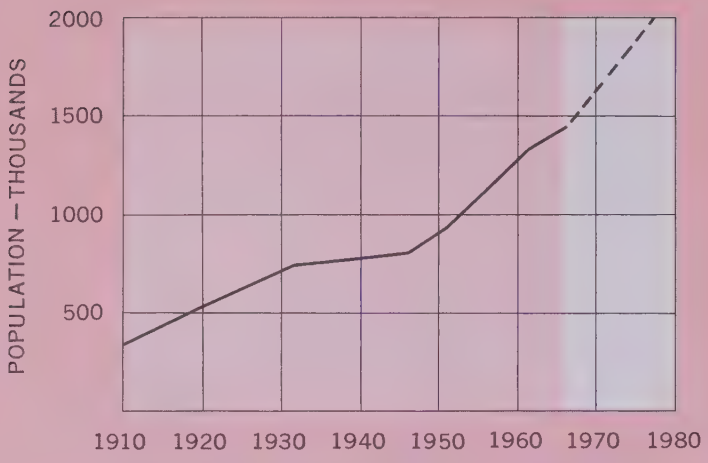
SUMMARY

It was recognized that a planning study was required to investigate the present District Highway and Local Road system to derive a sound system of Secondary Roads to meet the demand for service and quality. The intended result was a system of roads which could be constructed over a period of about twenty years at an acceptable rate of expenditure to produce a high standard paved network of roads integrated with the Provincial Primary Highway system.

The study would evaluate the existing Primary Highways, District Highways and Local Roads to identify the basic parts of the rural road network and organize them properly according to their functional and administrative classification. It was further intended the network ensure continuity throughout the Province and be of adequate mileage to produce an acceptable level of service to the overall rural area of the Province.

Based on this network, priorities could be brought forward for programs to construct the Secondary Road System in the most efficient and economical manner.

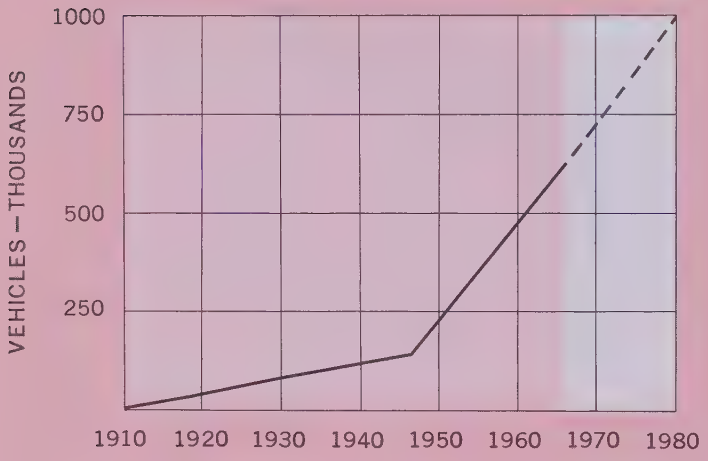
PROVINCIAL POPULATION



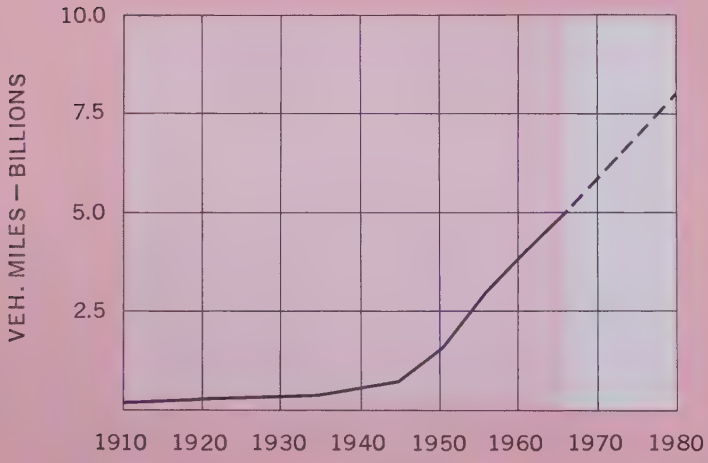
PROVINCIAL FUEL TAX

1922	2	cents per gallon of fuel
1929	5	cents per gallon of fuel
1933	6	cents per gallon of fuel
1935	7	cents per gallon of fuel
1947	9	cents per gallon of fuel
1951	10	cents per gallon of fuel
1960	10	cents per gallon of gasoline
	12	cents per gallon of diesel
1961	12	cents per gallon of gasoline
	14	cents per gallon of diesel

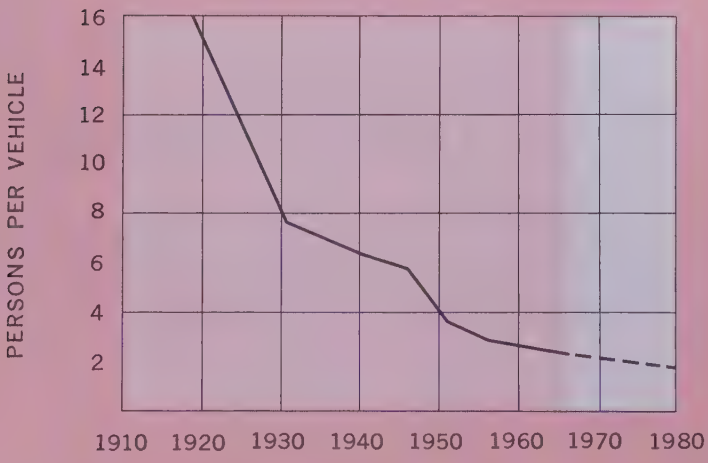
VEHICLE REGISTRATION



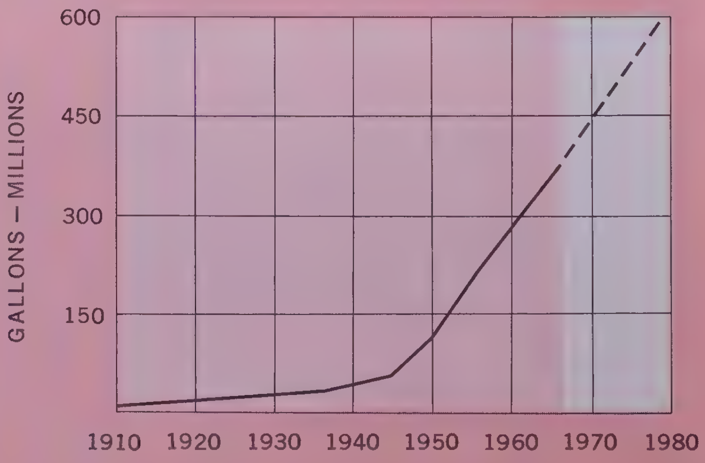
TOTAL TRAVEL



VEHICLE REGISTRATION PER CAPITA



FUEL CONSUMPTION



SYSTEM SELECTION AND CLASSIFICATION STUDY

SECONDARY ROAD SELECTION

In 1965 a program was embarked upon to define a system of Secondary Roads in the Province using as a basis for consideration the existing District Highway system and the local roads in the rural areas. A Scope and Procedures Manual outlining the objectives and methods to be followed was released late in 1965 and study areas and committees were formed. Studies were carried out during 1966 and were completed by the Spring of 1967.

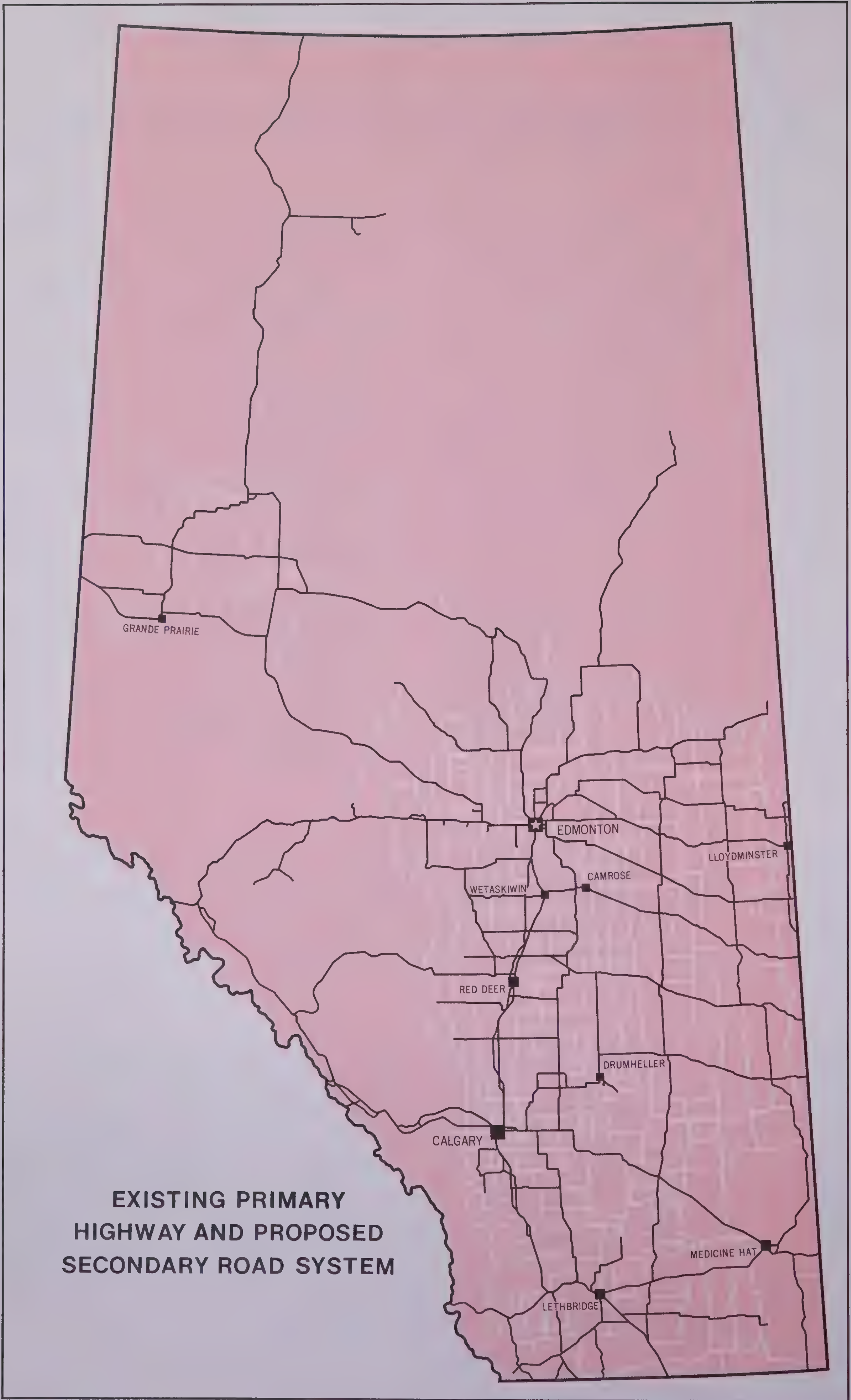
The studies were carried out by groupings of neighbouring Counties, Municipal Districts and Improvement Districts. There were nineteen study areas covering the Province. Each group organized a committee which consisted of representatives from the sponsoring municipal jurisdictions, representatives from the Provincial Department of Highways and including the services of a Professional Engineer and a qualified Planning Officer.

Each study involved an inventory of the existing road system, tabulation of existing traffic patterns and assembly of information on the physical features, population trends, land use data and fiscal data of the area. As a result of analysis of this information, proposals were developed for a system of roads to meet the traffic desire and demand. From these proposals a network of Secondary Roads was derived for each study area and the aggregate produced the Province-wide Secondary Road System.

The following guide lines were followed for developing the Secondary Road System:

1. To connect centres of traffic generation including centres of population of 100 or more and major recreational areas with one another and to the Primary Highway System.
2. To extend major urban arterial streets into the rural area to a point where the traffic volume is less than 400 vehicles per day, then complete the connection to a Primary Highway or other Secondary Road.
3. To parallel topographic barriers as required to relieve the necessity for numerous crossings.
4. To ensure continuity throughout the entire system.
5. To establish a road pattern spacing related approximately to population density in the following manner:
   7 to 8 persons per sq. mile - 5 mile spacing
   5 to 7 persons per sq. mile - 5 to 10 mile spacing
   3 to 5 persons per sq. mile - 10 to 15 mile spacing
   1 to 3 persons per sq. mile - 15 to 20 mile spacing.
6. To follow the existing road pattern where possible.
7. To consider the effect of the trading centre orientation on the traffic patterns of the various areas.

FREEWAYS AND EXPRESSWAYS CARRY LARGE VOLUMES OF THROUGH TRAFFIC UNDER FREE FLOW CONDITIONS.



EXISTING PRIMARY HIGHWAY AND PROPOSED SECONDARY ROAD SYSTEM

The Secondary Road network as proposed by the study area groups is shown by white lines with the existing Provincial Primary Highways as black lines. Proper classification of this network is necessary for definition of management and financial responsibility for the various classes of roads according to administrative and service functions.

NEED FOR CLASSIFICATION

Arising out of the Secondary Road studies was an obvious need to classify all of the Provincial rural roads. The rural road system including Primary Highways, Secondary Roads, local and other rural roads such as forestry and development roads, is composed of various road types and each performs a particular function in terms of traffic service and providing access to property.

Highway classification consists of the orderly grouping of roads into systems according to the type and amount of service they provide to the public.

The objectives of highway classification are to achieve the following:

1. To provide a basis for establishing integrated systems and assigning responsibility for each class of road to the level of government with the greatest basic interest.
2. Define classes of highways that require the same level of construction, maintenance and operation and to relate design standards to the roads in each class.
3. Establish a basis for developing priorities for long range programs and fiscal policies.

The factors to be considered in a classification study to identify the traffic service and land access service include traffic volume, characteristics of the traffic flow, vehicle types, adjacent land use and degree of land access required.

CLASSIFICATION METHODS

Highway classification may be categorized into two basic parts, administrative and functional.

The administrative classification establishes the level of government responsible for control and financing of each sub-system and is established by defining which governmental body has the greatest interest in each. Administrative classification of the rural road system includes:-

1. The Primary Highway System which is the full responsibility of the Provincial Government.
2. The Secondary Road System which is financed jointly by the Province and local government.
3. The Local Road System which is the responsibility of the local government.

The functional classification differentiates highway routes according to the function of each in terms of traffic service and the type of land service required of each. Basically Highway routes may be classified functionally as follows:-

1. Freeway -

   Multi-lane divided highways which accommodate the movement of large volumes of traffic under free flow conditions. These routes connect larger cities and major recreational areas and serve long distance provincial and inter-provincial travel. Freeways are primarily for the service of through traffic and do not provide access to abutting property; all entrances, exits and crossovers are effected through interchanges and grade separations.

SECONDARY ROADS FORM AN INTEGRATED NETWORK OF HIGH STANDARD, PAVED ROUTES THROUGHOUT THE DEVELOPED RURAL AREA OF THE PROVINCE.

RIVERS ARE NATURAL BARRIERS TO HIGHWAY CONTINUITY AND SIGNIFICANTLY INFLUENCE THE LOCATION OF RURAL HIGHWAY SYSTEMS.

2. Expressways -

These are multi-lane divided highways which accomplish the same aims and serve the same purpose as freeways except, some limited at-grade intersections are allowed although major intersections are grade separated or have interchanges. Expressways may be an intermediate step in stage construction of a freeway.

3. Arterial -

Arterial highways provide efficient service for high volumes of traffic between major traffic generators and carry a large proportion of long distance travel. Due to lesser volumes than on freeways and expressways, design standards are of a lower order. Access to abutting property is restricted or eliminated. Intersections are normally at-grade.

4. Collectors -

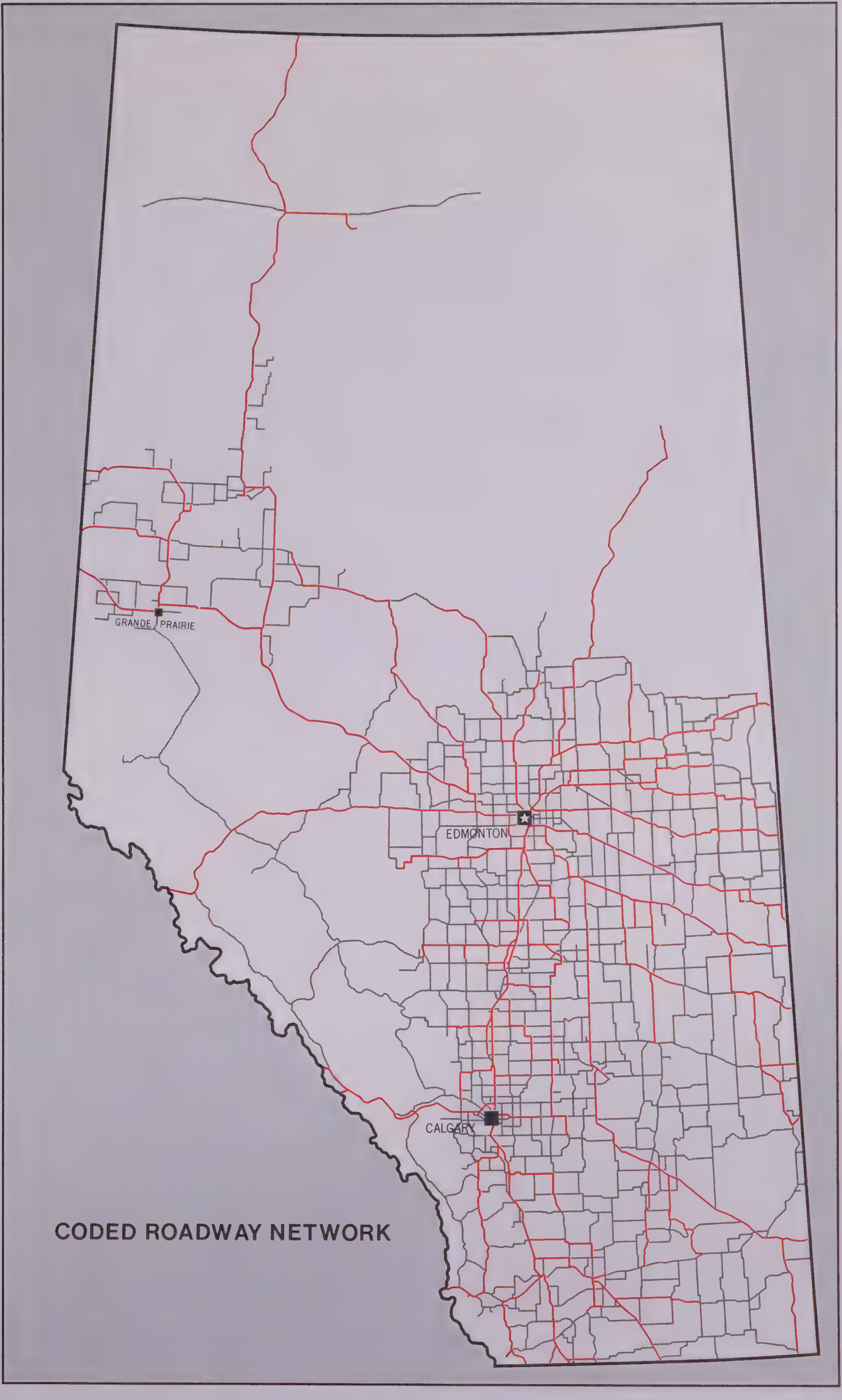
These are Secondary Roads which collect traffic from the local roads and feed it to arterials and freeways. They also connect smaller communities and generally form an integrated network throughout the developed area of the Province. Of equal importance to the traffic service function is the service of providing local access to adjacent property.

5. Local Roads -

These roads primarily provide land access and do not serve through traffic. They provide access from individual properties to collectors or arterials. Traffic volumes are normally low on local access roads.

There is an approximate equivalency that can be used in relating the administration and functional classifications which is as follows:-

Primary System — Freeways
— Expressways
— Arterials
Secondary System — Collectors
Local Road System — Local Roads



The existing Primary Highway and proposed Secondary Road systems are shown as a simulated network. The heavy lines indicate minimum time paths for trips between Edmonton and various centres of population and illustrate the directional desire of travel with respect to Edmonton. Minimum time paths are calculated for all the major areas of traffic generation and attraction.

RECREATIONAL TRAVEL CONTRIBUTES TO TO THE INCREASING DEMAND FOR MORE MILES OF BETTER QUALITY HIGHWAYS.

ADMINISTRATIVE CLASSIFICATION

Administrative classification is carried out using three criteria to separate the network of roads into subsystems.

1. Inter Centre Service

   The relative status of each urban area or centre of activity in the Provincial economy in some measure determines the degree of interest of each level of government in travel between them. The rural road system may be stratified according to the level of inter centre service rendered by each route.

   Inter centre service can be determined by using a hierarchy of centres and rating the connecting routes according to the relative importance of the centres connected. The ordering of the centres of activity is determined using factors based on the population and economic activity of each centre and those with the highest rating are used in the analysis.

   The proposed network is defined as a simulated network to give a coded highway network and travel paths are based on the minimum travel time between centres of activity. The relative trip making potential between the centres of activity, based on an interactance formula is assigned to the coded highway network. The potential trip exchange, summed for each route and called the intercentre rating of the route is used to determine which subsystem it should be assigned to.

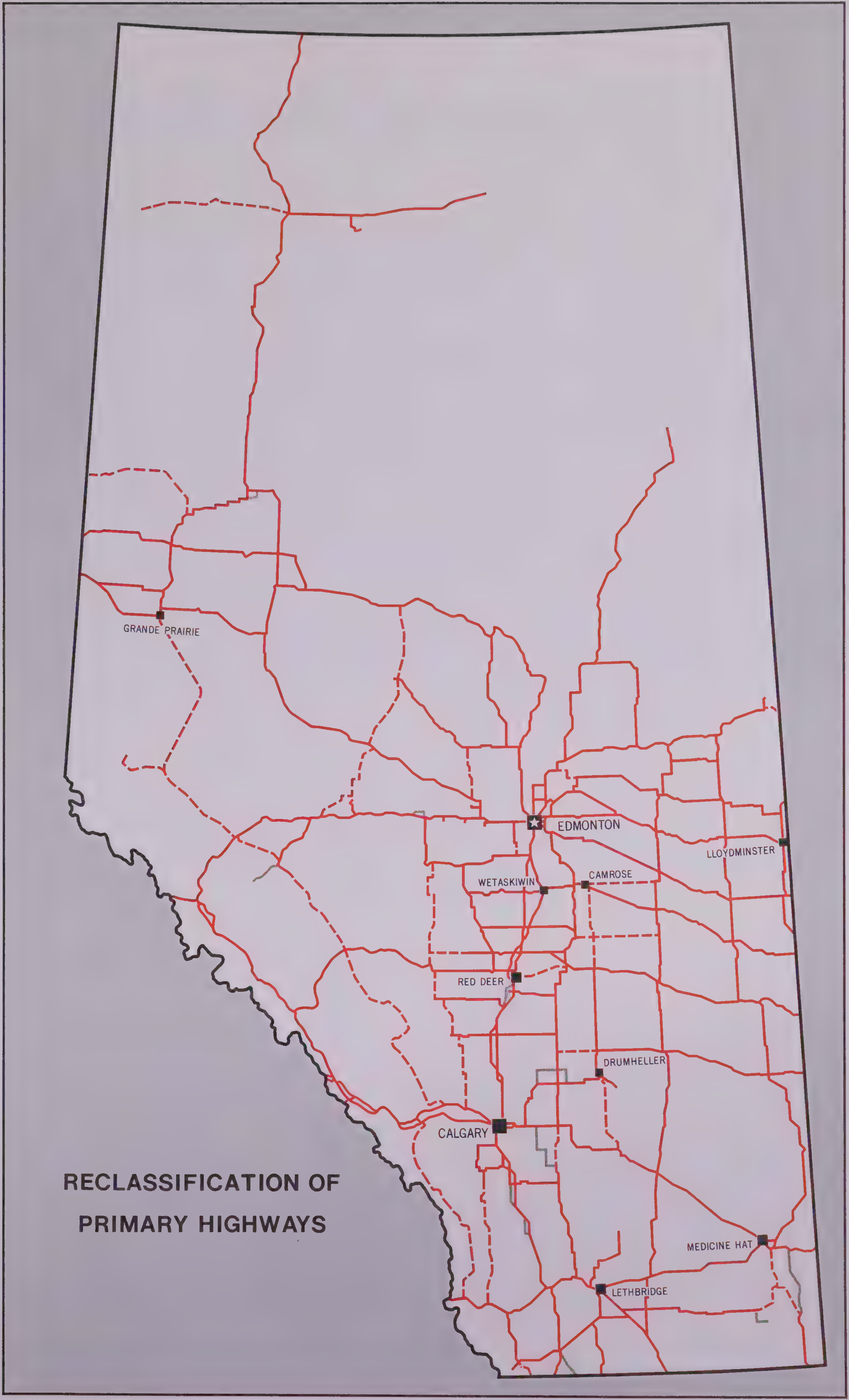
2. System Characteristics -

   A measure of a highway's importance can be based on an assessment of which routes makes the greatest contribution to the life and growth of the Province. The following guide lines are used in determining the characteristics of highways for inclusion in the Primary Highway System.

   a. The Primary System includes routes important for interprovincial travel, routes which carry a large percentage of long distance Provincial travel and routes which integrate with all major transportation systems.

   b. The Primary System includes those routes providing access for development of major resource areas.

   c. The Primary System includes roads serving long distance recreational travel.



The recommended Primary Highway system totals 8,145 miles of highways. As a result of the Classification Study 1,637 miles of roads, shown as dashed lines are added to the system and 219 miles of roads, shown as grey lines are deleted.

HIGH STANDARD ROADS REQUIRE MODERN CONSTRUCTION METHODS.

3. Rural Access Service -

A desirable objective of the various road sub-systems is that they provide a consistent level of service throughout the Province. This criterion is based on the premise that the level of rural access service provided by each system be the same to all users where similar conditions exist. To determine the level of rural access service, the accessibility of rural areas is related to the population density of the area.

The accessibility of each area enclosed by the rural highway system is measured as the distance from the most remote point in the area to the nearest highway. This is related to the population density of the area to determine areas which are within a band of adequate service. Areas which are under serviced are investigated to see if additional routes are required. Similarly, areas which are over serviced are investigated to determine if some routes proposed are redundant and appropriate deletions are made.

Areas of low population density, where there is little agricultural development, present a unique situation and other considerations such as provision of access to recreational areas or natural resource development have more bearing on the type and level of road service required than the criterion of level of rural access service.

FUNCTIONAL CLASSIFICATION

Functional classification of each highway is premised on an assessment of the traffic service function and the land access function of the route. The criteria for functional classification are based mainly on predicted traffic volumes and on the through desire versus the local access desire characteristics of the traffic using the highway. These criteria also evaluate the long-distance provincial and inter-provincial travel characteristics of each route.

RECOMMENDED RURAL HIGHWAY SYSTEM

The proposed Primary, Secondary and local road systems outlined in this section have been arrived at through application of the procedures and the criteria highlighted in the previous section on system selection and classification study. The highway routes were selected to fulfil the objectives of sound classification and provide a basis for further studies which can be undertaken to develop logical financial and construction policies. This information is essential to provide for equitable financing arrangements between levels of government and construction programs based on need and maximized benefits.

PROPOSED RURAL HIGHWAY SYSTEM

1. Primary Highway System

The administrative classification study gave a total figure of 8,145 miles for the proposed Primary Highway network. This is a net addition of 1,418 miles of proposed Primary routes to the existing Primary Highway mileage of 6,727 miles in 1966.

Of the recommended miles of additional routes, 876 miles were taken from the initial study area proposals for the Secondary system on the basis that they qualified as Primary routes by the criteria used. Approximately 632 miles are new proposals taken from Northern Development Roads and the Forestry Road network. The other 129 miles added to the system are those routes which are required for continuity but are not presently formally included as Primary routes. Some such routes are on extensions of Highways 21, 41 and 63.

Certain routes in the existing Primary system have been recommended for deletion as their functions have changed or become redundant where high standard facilities parallel older low standard roads. There are 219 miles of deletions for reversion to the Secondary or local road mileages.

Functional classification of the 8,145 miles of Primary highways designated 1,590 miles in the freeway-expressway class and the remaining 6,555 miles in the arterial class.

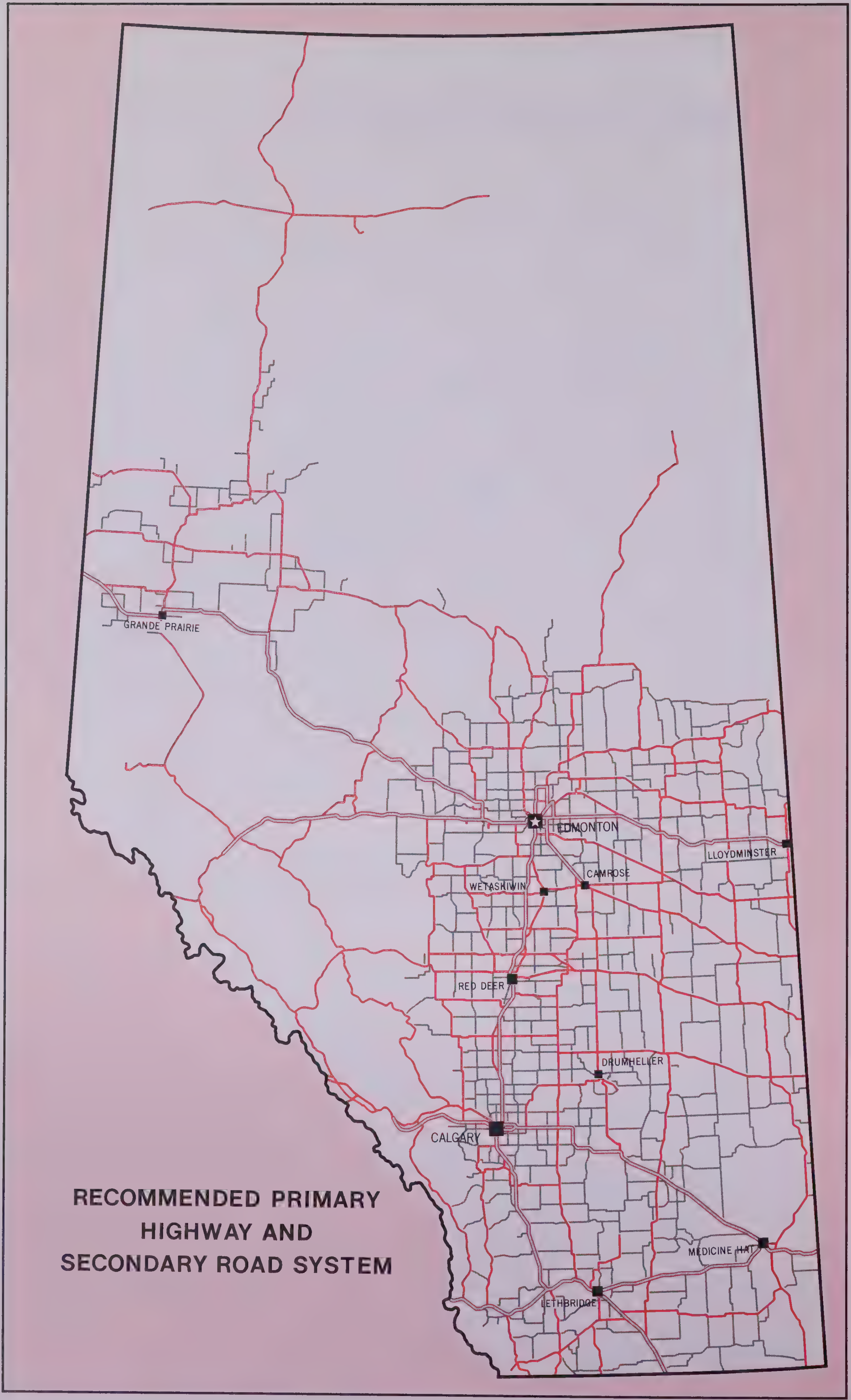
2. Secondary Road System

The initial proposals of the study area committees taken in aggregate for the Province produced 9,224 miles of rural roads for inclusion in the Secondary system. A number of the study area reports made recommendations that certain major routes in the proposed Secondary network be considered for inclusion in the Primary system. The classification study revealed that 876 miles of the Secondary proposals did qualify for Primary Highway status. Another product of the classification study was 219 miles of Primary Highways to be deleted, 138 miles of which maintained a degree of regional importance and reverted to Secondary Road status while the other 81 miles went into the local road system. The result of adjusting the initial proposed mileage of 9,224 miles by deleting 876 miles and adding 138 miles into the system is a proposed Secondary Road network comprising 8,486 miles of rural roads.

The proposed Secondary mileage of 8,486 miles includes 136 miles of road which pass through Indian Reserves, 50 miles which are concurrent with main highway access roads and 35 miles which are concurrent with Provincial Park access roads. The latter two types of road warrant special mention as main highway access roads and Provincial Park Access roads are presently administered under programs and appropriations separate from the previous District Highway program. The initiation of the Secondary system may, however, allow a new policy to be developed for the administration of these two categories of roads as, in spite of their dual function, they are essential to the Secondary system for continuity of the network.

COMPARISON OF RURAL HIGHWAY MILEAGES

	EXISTING SYSTEM	PROPOSED SYSTEM
PRIMARY HIGHWAYS	6,727	8,145
DISTRICT HIGHWAYS	19,854	—
SECONDARY ROADS	—	8,486



This map illustrates the recommended Primary Highway and Secondary Road systems with the Primaries shown as red lines and the Secondaries shown as grey lines. This network involves 8,145 miles of Primary Highways and 8,486 miles of Secondary Roads.

LEVEL OF SERVICE

The primary objective of a highway system is to provide the highest possible level of service, commensurate with the expenditure required for its development. The level of service should also have uniformity such that the same level of service is afforded all areas that are similar in nature. This may be measured in several ways.

The original criterion for selection of routes in the Secondary road study areas was related to present and future population density, population distribution and land use of the area. The second criterion relating to level of service was the rural access criterion of the classification study in which the remote distance of an area was related to the population density to define a band of acceptable service so areas which were under or over serviced could be isolated and the necessary adjustments made to the network to bring all areas into the band of acceptable rural access service.

The employment of these principles set the form of the rural highway system with regard to the level of service rendered by it.

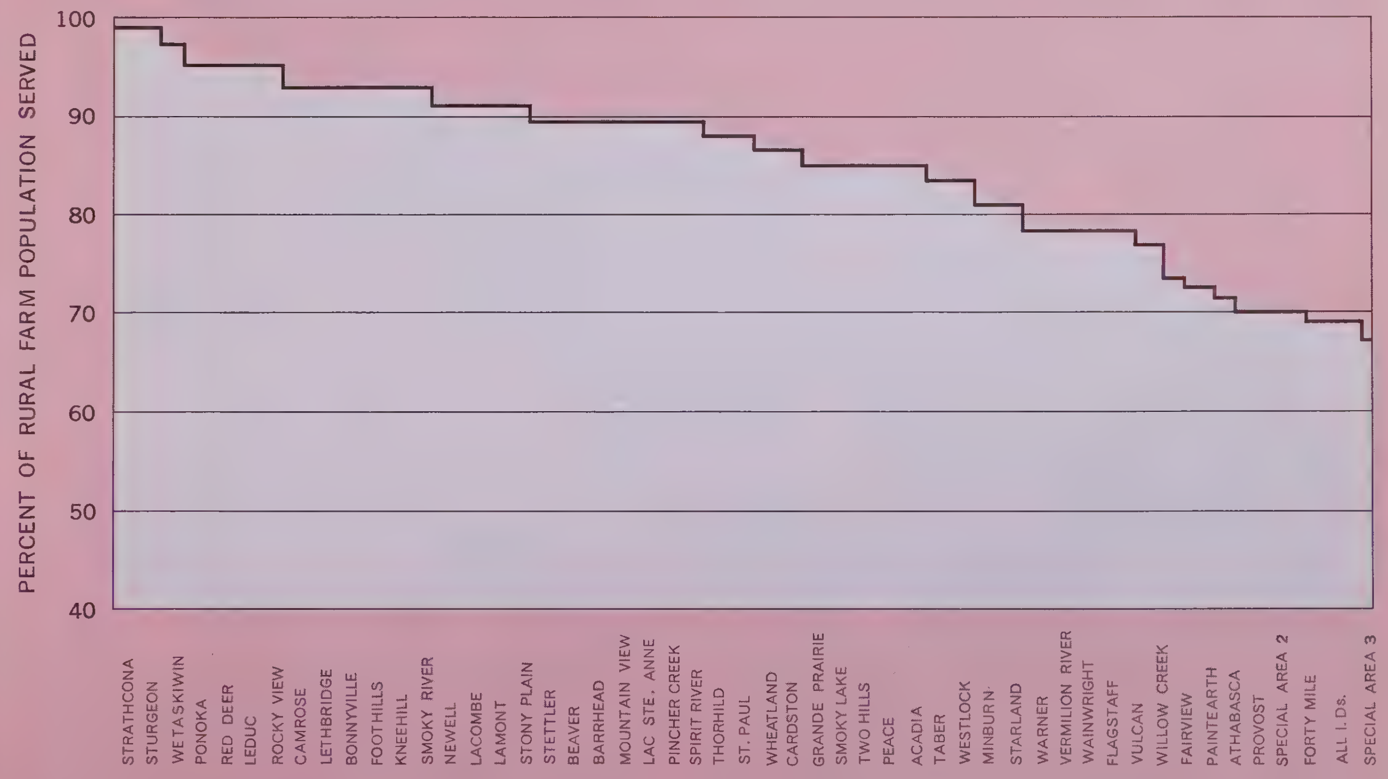
The actual level of service provided the rural farm population by the proposed rural highway system was tested by determining the percent of rural farm population that live within three miles of either a Secondary Road or Primary Highway. Only rural farm population was considered in this analysis as virtually all urban areas are connected by the rural highway system. The analysis was carried out with respect to each rural municipal jurisdiction.

This analysis revealed that the proposed rural highway system will provide accessibility to the rural area of the Province such that 84 percent of the Provincial rural farm population lives within three miles of a Primary Highway or Secondary Road. The percentage of farm population that is within three miles of the rural highway system varies from 99 percent in the more heavily populated Counties and Municipal Districts to a minimum of 67 percent in the lightly populated Improvement Districts and Special Areas.

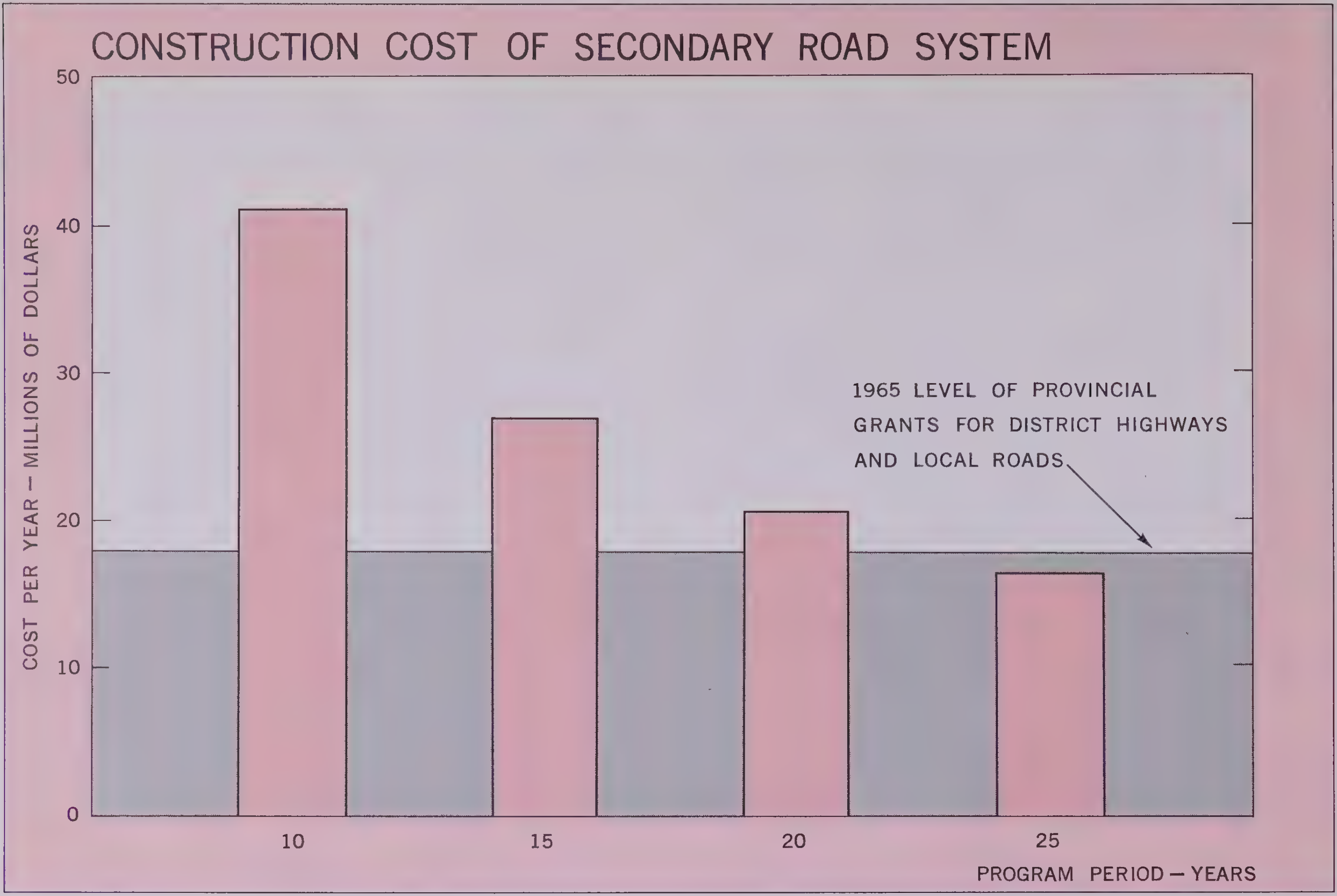
SECONDARY ROAD CONSTRUCTION COST

As part of the Secondary Road study carried out by the study area groups, a cost estimate was prepared for the proposed routes. Costs were estimated for right-of-way, clearing, grading, interim traffic gravel, base course and pavement on a 'per mile' basis using 1966 construction unit prices. The aggregate estimated expenditure required to develop the proposed Secondary system as a high standard paved facility is approximately Four Hundred Million Dollars. Taken over a twenty year period of implementation the approximate total annual expenditure would be Twenty Million Dollars.

PERCENT OF RURAL FARM POPULATION WITHIN 3 MILES OF A PRIMARY HIGHWAY OR SECONDARY ROAD—BY MUNICIPAL JURISDICTION



84% OF PROVINCIAL RURAL FARM POPULATION IS WITHIN 3 MILES OF A PRIMARY HIGHWAY OR SECONDARY ROAD



CONSTRUCTION COST OF SECONDARY ROAD SYSTEM

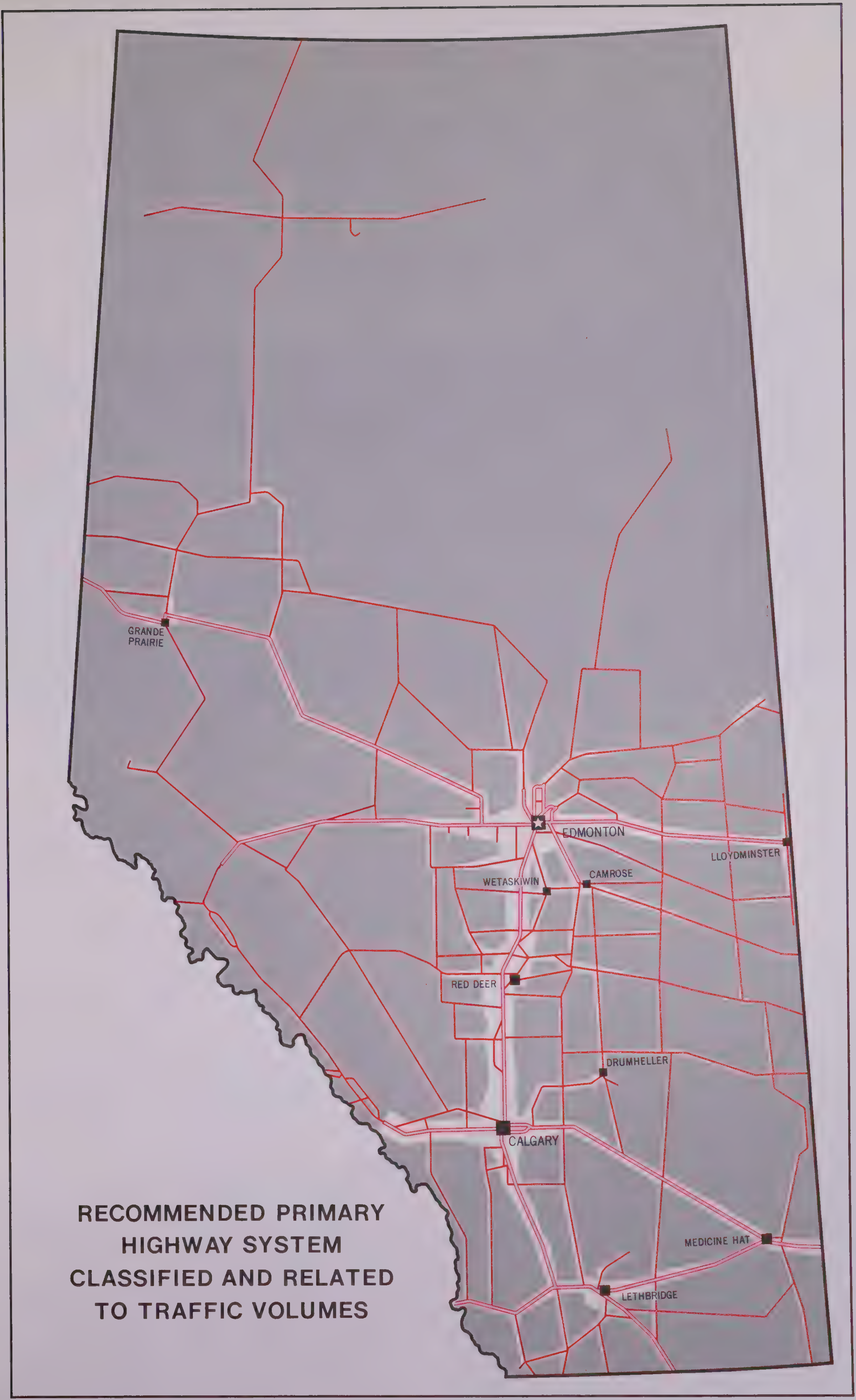
FUNCTIONAL CLASSIFICATION

The Canadian Good Roads Association has defined guide lines for the percentage of a road network that should be allocated to each class of road within that system. The recommended limits for each are: Freeways to a maximum of 5 percent, Arterials 5 to 10 percent, Collectors 10 to 20 percent and local roads 65 to 85 percent.

The existing network of rural highways in Alberta has the following breakdown by functional classes: Freeways, Expressways and Arterials combined make up 7.4 percent of the total, Collectors, which represent

FUNCTIONAL CLASSIFICATION OF RURAL HIGHWAYS

	C.G.R.A. RECOMMENDED SYSTEM	EXISTING SYSTEM	PROPOSED SYSTEM
PRIMARY HIGHWAY:			
FREEWAY / EXPRESSWAY	TO 5 %	7.4%	1.7%
ARTERIAL	5 % – 10%		7.0%
SECONDARY ROADS:			
COLLECTOR	10% – 20%	22.0%	9.1%
LOCAL ROADS	65% – 85%	70.6%	82.2%



RECOMMENDED PRIMARY HIGHWAY SYSTEM CLASSIFIED AND RELATED TO TRAFFIC VOLUMES

Traffic flow volumes on the Primary Highway system are shown as white bands. The relative volume is shown by the band width. The freeway–expressway system shown by double lines serves the heaviest traffic volumes. Arterial highways, shown as single lines serve the lighter through traffic volumes.

AESTHETICALLY PLEASING STRUCTURES BLEND WITH THE NATURAL SURROUNDINGS.

the District Highway system 22.0 percent and local roads 70.6 percent. This again highlights the rural road problem in which the collector or District Highway system is proportionately too large while the local road system is relatively too small.

Secondary Road selection and subsequent classification of the rural highway system produced a better alignment of functional classes with the Canadian Good Roads Association recommendations. The new classification breakdown includes: Freeways and Expressways 1.7 percent of the total, Arterials 7.0 percent, Collectors, which represents the Secondary Road network 9.1 percent and local roads 82.2 percent of the system.

The reduction in the collector or Secondary Road system resulting from the classification study increased the local road mileage from 70.6 percent to 82.2 percent. It also decreased the collector or Secondary mileage from 22.0 percent to 9.1 percent which is below the lower limit recommended by Canadian Good Roads Association for this class. On the surface this would seem to indicate that the Secondary mileage is deficient in mileage but it is more likely an indication that the total rural road mileage and particularly the local road mileage is too large.

A reduction in the local road mileage would reflect higher percentages in the Freeway, Expressway, Arterial and Collector classes but would show a reduction in the local road percentage.

The original Township layout for Alberta is laid out on a grid pattern with a one mile spacing for North-South road allowances and a two mile spacing for East-West road allowances and was intended to service farms of a quarter section in size. Road systems in Alberta have historically developed along these road allowances, often producing redundant routes and large mileages of local roads.

Some means of rationalizing the local road mileage and controlling its growth must be implemented to keep the total highway system in balance. A reduction in the need for local access roads could be accomplished through a system of land management. The minimum size of any farm could be based on the smallest economical unit, determined by the type of farming operation that can be successfully carried on in the various areas of the Province. The larger size farms produced by this method would consequently decrease the number of local roads required to provide access to them.

CONCLUSION

The Secondary Road selection and rural highway classification study produced a rural highway network classified into sub-systems according to administrative responsibility and functional requirements of the traffic demand. The classes of the sub-systems define the level of government responsible for control and financing of each, and the standards for construction and operation of each highway route.

Additional studies are being continued to, firstly assess the deficiencies in the systems and secondly set priorities according to achievement of maximum benefits for the indicated expenditure and from this define programs for construction of the system.

APPENDIX

RURAL HIGHWAY SYSTEM — BY MUNICIPAL JURISDICTIONS

JURISDICTION	PRIMARY HIGHWAYS Existing Mileage	PRIMARY HIGHWAYS Proposed Mileage	DISTRICT HIGHWAY Existing Mileage	SECONDARY ROAD Proposed Mileage
COUNTIES				
Cty. No. 1 — GRANDE PRAIRIE	134	140	497	145
Cty. No. 2 — VULCAN	72	66	530	180
Cty. No. 3 — PONOKA	111	111	313	152
Cty. No. 4 — NEWELL	117	124	328	249
Cty. No. 5 — WARNER	89	110	274	134
Cty. No. 6 — STETTLER	70	102	406	183
Cty. No. 7 — THORHILD	53	64	197	80
Cty. No. 8 — FORTY MILE	90	98	461	241
Cty. No. 9 — BEAVER	92	111	395	139
Cty. No. 10 — WETASKIWIN	102	122	277	155
Cty. No. 11 — BARRHEAD	33	46	238	111
Cty. No. 12 — ATHABASCA	96	106	344	162
Cty. No. 13 — SMOKY LAKE	64	64	186	70
Cty. No. 14 — LACOMBE	146	174	232	76
Cty. No. 16 — WHEATLAND	98	123	495	201
Cty. No. 17 — MOUNTAIN VIEW	94	129	282	165
Cty. No. 18 — PAINTEARTH	79	79	311	115
Cty. No. 19 — ST. PAUL	81	81	286	132
Cty. No. 20 — STRATHCONA	89	91	131	95
Cty. No. 21 — TWO HILLS	104	104	458	106
Cty. No. 22 — CAMROSE	91	152	477	114
Cty. No. 23 — RED DEER	173	166	426	203
Cty. No. 24 — VERMILION RIVER	150	150	390	176
Cty. No. 25 — LEDUC	113	134	334	162
Cty. No. 26 — LETHBRIDGE	120	120	181	124
Cty. No. 27 — MINBURN	91	91	338	133
Cty No. 28 — LAC STE. ANNE	66	84	254	149
MUNICIPAL DISTRICTS				
M.D. No. 6 — CARDSTON	117	102	142	121
M.D. No. 9 — PINCHER CREEK	55	73	173	94
M.D. No. 14 — TABER	87	87	325	158
M.D. No. 26 — WILLOW CREEK	89	82	250	125
M.D. No. 31 — FOOTHILLS	136	140	406	215
M.D. No. 34 — ACADIA	12	28	117	31
M.D. No. 44 — ROCKY VIEW	132	154	560	329
M.D. No. 47 — STARLAND	56	64	278	94
M.D. No. 48 — KNEEHILL	122	108	332	218
M.D. No. 52 — PROVOST	71	88	312	93
M.D. No. 61 — WAINWRIGHT	106	106	365	125
M.D. No. 62 — FLAGSTAFF	84	107	569	130
M.D. No. 82 — LAMONT	91	95	376	103
M.D. No. 84 — STONY PLAIN	81	81	237	130
M.D. No. 87 — BONNYVILLE	54	57	204	125
M.D. No. 90 — STURGEON	89	89	1068	125
M.D. No. 92 — WESTLOCK	78	78	365	127
M.D. No. 130 — SMOKY RIVER	97	97	190	78
M.D. No. 133 — SPIRIT RIVER	37	37	65	14
M.D. No. 135 — PEACE	40	33	107	40
M.D. No. 136 — FAIRVIEW	33	43	113	20

RURAL HIGHWAY SYSTEM — BY MUNICIPAL JURISDICTIONS

IMPROVEMENT DISTRICTS	PRIMARY HIGHWAYS Existing Mileage	PRIMARY HIGHWAYS Proposed Mileage	DISTRICT HIGHWAY Existing Mileage	SECONDARY ROAD Proposed Mileage
I.D. No. 8	—	—	—	—
I.D. No. 10	15	15	—	20
I.D. No. 11	184	181	342	104
I.D. No. 22	34	34	113	96
I.D. No. 24	—	—	—	—
I.D. No. 27	—	34	52	29
I.D. No. 33	—	—	—	—
I.D. No. 42	18	18	18	8
I.D. No. 46	50	50	10	—
I.D. No. 50	—	—	3	—
I.D. No. 51	—	—	—	—
I.D. No. 58	—	11	23	17
I.D. No. 65	58	108	313	65
I.D. No. 68	—	18	—	10
I.D. No. 69	80	80	—	—
I.D. No. 77	28	28	47	35
I.D. No. 78	67	59	176	91
I.D. No. 79	53	33	—	12
I.D. No. 80	—	—	—	—
I.D. No. 85	—	—	12	4
I.D. No. 95	96	140	59	2
I.D. No. 96	—	87	—	9
I.D. No. 97	5	5	—	—
I.D. No. 101	—	7	108	49
I.D. No. 102	72	78	295	96
I.D. No. 107	67	67	40	5
I.D. No. 108	18	18	32	22
I.D. No. 109	47	97	72	14
I.D. No. 110	63	63	—	—
I.D. No. 111	—	4	30	11
I.D. No. 121	56	56	—	—
I.D. No. 122	—	—	20	18
I.D. No. 123	17	52	9	—
I.D. No. 124	72	87	30	16
I.D. No. 125	35	35	111	78
I.D. No. 126	71	71	35	68
I.D. No. 128	—	—	—	—
I.D. No. 129	—	—	27	4
I.D. No. 131	25	25	94	55
I.D. No. 132	34	34	93	32
I.D. No. 134	59	59	96	78
I.D. No. 138	86	86	119	106
I.D. No. 139	—	105	193	101
I.D. No. 143	63	63	—	—
I.D. No. 144	—	—	—	—
I.D. No. 145	—	—	19	—
I.D. No. 146	43	43	43	—
I.D. No. 147	203	233	91	—
I.D. No. 148	23	23	—	—
I.D. No. 149	58	120	—	—
SPECIAL AREAS No. 2 & 3	253	312	1380	648
INDIAN RESERVES	118	125	154	136
FORESTRY ROADS	—	419	—	—
INCORPORATED AREAS	271	271	—	—
TOTALS	6727	8145	19854	8486

58 Alberta. Dept. of Highways.
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Alberta secondary road
system; a report to the
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